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# Physics Abstracts

Science Abstracts Series A  
January-June 1981

Subject Index (M - Z)

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## SIX-MONTHLY INDEXES TO SCIENCE ABSTRACTS

Cumulative indexes to Science Abstracts are published twice a year covering the period January-June and July-December. They comprise author and subject indexes and some specialised or 'small' indexes. For Physics Abstracts and Electrical & Electronics Abstracts the Author Index and Subject Index are published as separate volumes. In this case the Small Indexes are included in the Author Index volume.

Cumulative author and subject indexes for preceding years are also available. For details please see inside back cover.

### Subject Index

The Subject index provides an alphabetical subject key to the articles included in the abstracts journal. Some general guidance on its use is given below:

1. Look in the index for the name of the specific subject in which you are interested. In most cases this name will be a heading in the index and you will find relevant articles listed under it. The majority of the subject headings fall into the following categories: property, phenomena, substance or named objects, instrument, device, theory, method, process, application, event.
2. Occasionally you will be directed from the subject heading chosen to a different heading under which the relevant or additional articles are listed.
3. If you do not find the subject heading you first chose, try a more general heading.
4. Each entry under the heading relates to an article appearing in the abstracts journal and gives the serial number of that article in the journal preceded by the last digit of the current year, e.g. 1-12345; i.e. Abstract number 12345 in the abstracts journal for 1981

The language of the article, if it is not in English, is also indicated. e.g. digital frequency meter jamming, distribution function determ. (Russian) 1-41575.

Each entry starts with a Keyword or Keyphrase considered to be most relevant to the heading. On sorting these Keywords, the qualifying prefixes are usually ignored. (e.g.  $\alpha$ -brass, 5-sulphosalicylic, 31 Cygni, n-Ge are sorted under brass, sulphosalicylic, Cygni, Ge respectively).

There are three main Keyword lists; alphabetical A-Z, elementary particles, and chemical symbols (organic substances are written and not given as chemical formula). More than one Keyword list may be present under each subject heading.

For document on, say, 'photoemission of germanium' at least two access points 'photoemission' and 'Germanium' are provided. Under the heading 'photoemission' the Keyword will be 'Ge' and under 'germanium' the Keyword will be 'photoemission'.

In a case like this, it is advisable and quicker to use the heading 'photoemission' and go straight to the chemical symbol list for 'Ge'.

Intermetallic compounds are indexed under the appropriate alloy headings. The chemical formula is used as Keyword. However, it is important to realise in searching the chemical symbol list that, at present, alloys and intermetallic compounds are sorted separately. For example FeCo is sorted at the end of the Fe- list e.g. Fe-Al, ... Fe-Co, ... Fe-Si, ... Fe-Si-B, ... FeCo, ... FeSi and so on in this order.



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# Abbreviations and Acronyms

Abbreviations and acronyms are used in the modifiers in all INSPEC Cumulative Subject Indexes. Individual terms should be readily understood in the context of the subject headings. **Inorganic substances** are usually given by their chemical formulae. Iron and aluminium garnets appear in the formulae lists as MIG and MAG (where M is metal element, e.g. YIG and YAG);  $(\text{Pb},\text{La})(\text{Zr},\text{Ti})\text{O}_3$  and  $\text{Ce}_2\text{Mg}_3(\text{NO}_3)_{12}$  appear as PLZT and CMN respectively. **Organic substances** including **liquid crystals** are not given as formulae but common abbreviations are used.

ABS resin	acrylonitrile-butadiene-styrene	CRO	cathode ray oscilloscope
AC	alternating current	CRT	cathode ray tube
ACV	air cushion vehicle	CS	coupled states
A/D	analogue-to-digital	CSM	continuous slowing down models
ADP	administrative data processing	CTR	controlled thermonuclear reactor
AES	Auger electron spectra(oscopy)	CVD	chemical vapour deposition
AF	audio frequency	CW	continuous wave
AFC	automatic frequency control		
AFL	abstract family of languages	D/A	digital-to-analogue
AGC	automatic gain control	DBR	distributed Bragg reflector
AGR	advanced gas-cooled reactor	DC	direct current
AM	amplitude modulation	DDC	direct digital control
ANS	Astronomical Netherlands Satellite	DDL	diode-diode logic
APACHE	accelerator for physics and chemistry of heavy elements	DECENT	distribution of exact classical energy transfer
APR	acoustic paramagnetic resonance	DESY	Deutsches Electron Synchrotron
APS	appearance potential spectra(oscopy)	DF	Dirac-Fock
APW	augmented plane wave	DFB	distributed feedback
ATR	attenuated total reflection	DH	double heterostructure
ATS	applications technology satellite	DIL	dual-in-line
ATWS	anticipated transients without scram	DITE	divertor in torus experiment
AVC	automatic volume control	DLTS	deep level transient spectra(oscopy)
		DM	delta modulation
BARITT	barrier injection transit time	DMSO	dimethylsulphoxide
BBEA	4-butoxybenzal-4'-ethylaniline	DMSS	Defence Meteorological Satellite System
BCC	body centred cubic	DOBAMBC	p-decyloxybenzylidene p'-amino 2-methyl butyl cinnamate
BCD	binary-code decimal		
BFO	beat-frequency oscillator	DODS	different orbitals for different spins
BWO	backward wave oscillator	DORIS	Dopple-ring-Speicher
BWR	boiling water reactor	DOVETT	double velocity transit time
BWT	backward wave tube	DP	data processing
		DPCM	differential pulse code modulation
CAD	computer aided design	DPPH	diphenylpicrylhydrazyl
CAI	computer assisted instruction	DPSK	differential phase shift keying
CARS	coherent antiStokes Raman scattering (spectra)	DSC	differential scanning calorimetry
CATV	community antenna TV	DTA	differential thermal analysis
CB	citizen band	DV-X $\alpha$	discrete variational X $\alpha$ method
CBOOA	cyanobenzylidene octyloxyaniline		
C-CD	charge-coupled device	E1,E2	electric dipole, quadrupole
CDI	collector diffusion isolation	EAS	extensive air shower
CDM	code division multiplexing	EB	exponential Born
CDW	charge-density wave	EBBA	4-ethoxybenzylidene-4'-n-butylaniline
CEM	channel electron multiplier	EBR	experimental breeder reactor
CEPA	coupled electron pair approximation	EBT	Elmo Bumpy Torus
CERN	Conseil Européen pour la Recherche Nucléaire	ECC	emergency core cooling
CESR	conduction electron spin resonance	ECELR	epithermal critical experiment laboratory reactor
CGTO	contracted Gaussian-type orbital	ECG	electrocardiography (-gram)
CHF	coupled Hartree-Fock	EDA	ethylene diamine
CI	configuration interaction	EDP	electronic data processing
CIEH	charge iterated extended Huckel	EDTA	ethylene diamine tetra-acetic acid
CIHY	configuration interaction Hylleras	EEBAC	ethyl-4-(4'ethoxy-benzylidene-amino) cinnamate
CNDO	complete neglect of differential overlap		
COC	cholesteryl oleyl carbonate	EEG	electroencephalography (-gram)
COM	computer output to microform (fiche or film)	EELS	electron energy loss spectra
COOB	4,4'-cyano-octyloxy-biphenyl	EFM	extended Flygare method
CP	charge, parity	EHD	electrohydrodynamics
CPA	coherent potential approximation	EHF	extremely high frequency
CPSK	coherent phase shift keying	EHP	electron-hole potential method
CPT	charge, parity, time	EHT	extended Huckel theory
		EHV	extra high voltage
		ELDOR	electron electron double resonance



ELF	extremely low frequency	HOMO	highest occupied molecular orbitals
EM	electromagnetic	HORM	hybrid orbital rehybridisation method
EMC	electromagnetic compatibility	HTGR	high temperature gas-cooled reactor
EMF	electromotive force	HV	high voltage
EMG	electromyography(-gram)	HVEM	high voltage electron microscopy
ENDOR	electron nuclear double resonance	HWR	heavy water reactor
EOS	earth observatory satellite	IAEA	International Atomic Energy Authority
EPEN	empirical potential energy function based on interactions of electrons and nuclei	Agency	
EPMA	electron probe microanalysis	IBPBAC	isobutyl-4-(4'-phenylbenzylideneamino) cinnamate
EPR	electron paramagnetic resonance	IC	integrated circuit
ERG	electroretinography(-gram)	ICDF	intermediate coupling Dirac-Fock
ERPS	extramolecular relaxation polarisation shift	IDT	interdigital transducer
ERTS	earth resources technology satellite	IEPA	independent electron pair approximation
ESCA	electron spectroscopy for chemical analysis	IF	intermediate frequency
ESCAR	experimental superconducting accelerating ring	IGFET	insulated gate field effect transistor
ESFI	epitaxial silicon film on insulator	IKO	Institute v. Kernph Ouder Amsterdam
ESS	electronic switching system	I <sup>2</sup> L	integrated injection logic
EUV	extreme ultraviolet	I <sup>3</sup> L	isoplanar I <sup>2</sup> L
EXAFS	extended X-ray absorption fine structure	ILS	instrument landing system
		IMPATT	impact avalanche transit time
FBR	fast breeder reactor	INDO	intermediate neglect of differential overlap
FCC	face centred cubic	INDOR	internuclear double resonance
FDM	frequency division multiplex(ing)	ING	intense neutron generator
FDNC	frequency dependent negative conductance	INO	iterative natural orbital
FDNR	frequency dependent negative resistance	INTELSAT	international telecommunications satellite consortium
FEM	field emission microscopy	I/O	input/output
FET	field effect transistor	IOC- $\omega$	inclusion of the overlap charges in the omega
FFHR	fusion-fission hybrid reactor	IR	infrared
FFT	fast Fourier transform	IRDO	intermediate retention of differential overlap
FFTF	fast flux test facilities	ISABELLE	intersecting storage and acceleration
FIM	field ion microscopy	ISR	intersecting storage ring
FM	frequency modulation	ISX	impurity study experiment
FPT	finite perturbation theory	ITEP	Institute of Theoretical and Experimental Physics
FSK	frequency-shift keying	IU	Indiana University
FSGO	floating spherical Gaussian orbitals	IVO	improved virtual orbitals
FTR	fast test reactor	JET	Joint European torus
		JAERI	Japan Atomic Energy Research Institute
GAMBIT	gate modulated bipolar transistor	JINR	Joint Institute for Nuclear Research
GANIL	grand accélérateur national a ions Lourds	KEK	Japan National Laboratory for High Energy Physics
GARP	global atmospheric research programme	KKR	Korringa-Kohn-Rostoker
GATE	GARP Atlantic tropical experiment	LAMPF	Los Alamos meson physics facility
GCFR	gas-cooled fast breeder reactor	LC	inductance-capacitance
GCM	generator coordinate method	LCAO	linear combination of atomic orbitals
GHF-NO-CI	generalised Hartree-Fock/natural orbital/configuration interactions	LCBO	linear combinations of (semi-localised) band orbitals
GIAO	gauge-invariant atomic orbitals	LCGO	linear combination of Gaussian orbitals
GO	Gaussian orbitals	LCP	large coil program
GOO	generalised Overhauser orbitals	LCRO	linear combination of Rydberg orbitals
GPM	ground potential model	LEC	liquid encapsulated Czochralski
GSO	general spin orbitals	LED	light emitting diode
GTO	Gaussian-type orbitals	LEED	low energy electron diffraction
GVB	generalised valence bond	LEP	large electron positron
		LET	linear energy transfer
HAM	hydrogenic atoms in molecules	LF	low frequency
HBAB	hexyloxybenzylidene-p' aminobenzonitrile	LMC	Large Magellanic Cloud
HBT	N-(p-hexyloxybenzylidene)-p-toluidene	LMFBR	liquid metal fast breeder reactor
HCDA	hypothetical core disruptive accident	LMTO	linear combination of muffin tin orbitals
HCP	hexagonal close packed	LOCA	loss of coolant accident
HEED	high energy electron diffraction	LOCE	loss of coolant experiment
HF	high frequency or Hartree-Fock	LOFT	loss of flow test facility
HFB	Hartree-Fock-Bogoliubov	LPE	liquid phase epitaxy
HFER	hot fuel examination facility	LSA	limited space charge accumulation
HFIR	high flux isotope reactor		
HFO	Hartree-Fock-Overhauser		
HFS	hyperfine structure		
HLW	high level waste (radioactive)		
HMO	Huckel molecular orbitals		
HOAB	heptyloxyazobenzene		
HOBHA	p-n-heptyloxy-benzylidene-p-n heptylaniline		



LSD	local spin density	ODMR	optical detection of magnetic resonance
LSI	large-scale integration	OER	oxygen enhancement ratio
LTE	local thermodynamic equilibrium	OGO	orbiting geophysical observatory
LUMO	lowest unoccupied molecular orbitals	OPHF	orbital polarised Hartree-Fock
LV	low voltage	OPW	orthogonal plane wave
LWR	light water reactor	OR	operations research
MADO	Mulliken approximation for differential overlap	ORELA	Oak Ridge electron linear accelerator
M1,M2	magnetic dipole, quadrupole	ORNL	Oak Ridge National Laboratory
MBBA	4-methoxybenzylidene-4'-n-butyl-aniline	OSO	orbiting solar observatory
MBE	molecular beam epitaxy	OTF	optical transfer function
MBPT	many body perturbation theory	PAA	paraazoxyanisole
MCD	magnetic circular dichroism	PABX	private automatic branch exchange
MCPESCF	multiconfiguration paired excitation SCF	PAC	perturbed angular correlation
MCZDO	multi-centre zero differential overlap	PAHR	post accident heat removal
MEDO	multipole expansion of diatomic overlap	PAM	pulse amplitude modulation
MESFET	metal-semiconductor field effect transistor	PAMPUS	photons for atomic and molecular processes and universal studies
MF	medium frequency	PAP	paraazoxyphenetole
MFP	mean free path	PBF	power bursts facility
MHD	magnetohydrodynamics	PBR	pebble bed reactor
MIC	microwave integrated circuit	PBX	private branch exchange
MIEHM	modified iterative extended Huckel method	PC	printed circuit
MIM	metal-insulator-metal	PCAC	partially conserved axial currents
MIS	metal-insulator-semiconductor or management information system	PCB	printed circuit board
MIT	Massachusetts Institute of Technology	PCGVb	pairwise correlated generalised valence bond
MMF	magnetomotive force	PCILOCC	perturbative configuration interaction using localised orbitals for crystal calculation
MNOS	metal-nitride-oxide-semiconductor	PCM	pulse code modulation
MO	molecular orbitals	PCX	plasma confinement experiment
MOCIC	molecular orbital constraint of interaction coordinates	PDX	poloidal divertor experiment
MODPOT	model potential	PEP	positron electron proton
MOS	metal-oxide-semiconductor	PETRA	positron electron tandem ringbeschleuniger anlage
MOSFET	metal-oxide-semiconductor field effect transistor	PF	power factor
MOST	metal-oxide-semiconductor transistor	PFM	pulse frequency modulation
MRD	multi-reference double excitation	PHWR	pressurised heavy water reactor
MRINDO	modified Rydberg INDO	PID(PI,PD)	proportional+integral+differential (derivative)
MSI	medium scale integration	PLA	phase locked arrays
MSR	molten salt reactor	PLC	programmable logic control
MSU	Michigan State University	PLL	phase locked loops
MTBF	mean-time between failures	PLT	Princeton Large Torus
MTF	modulation transfer function	PM	pulse modulation
MTX $\alpha$	muffin-tin X $\alpha$	PMMA	polymethylmethacrylate
MUF	maximum usable frequency	PMDR	phosphorescence microwave double resonance
MWH	Mulliken-Wolfsberg-Helmholz-semi-empirical method	PND0	partial neglect of differential overlap
NAL	National Accelerator Laboratory	PNO-CI	pair natural orbital configuration interaction
NAND	not-and(logic)	POL	pair orthogonalised Lowdin
NC	numerical control	POPAE	protons on protons and electrons
NCMET	non-closed shell many electron theory	POPOP	phenyl-oxazolyl-phenyl-oxazolyl-phenyl
NDDO	neglect of diatomic differential overlap	POS	point of sale
NDT	nondestructive testing	PPDP/S	Pariser-Parr-Del Bene-Pople/Segal calculations
NEMO	non-empirical molecular orbitals	PPI	plan position indicator
NEVE	non-empirical valence-electron	PPM	pulse position modulation or parts per million
NIC	negative impedance convertor	PPP	Pariser-Parr-Pople
NMR	nuclear magnetic resonance	PRDDO	partial retention of diatomic differential overlap
NNNDO	neglect of non-neighbour differential overlap	PRF	pulse recurrence (repetition) frequency
NOR	not-or(logic)	PROM	programmable read-only-memory or Pockels readout optical modulator
NPOST	non-perturbative open-shell theory	PS	proton synchrotron (CERN)
NPSO	non-paired spatial orbitals	PSK	phase shift keying
NQR	nuclear quadrupole resonance	PTFE	polytetrafluoroethylene
NRC	nuclear regulatory committee	PTM	pulse time modulation
NRM	natural remanent magnetisation	PVC	polyvinyl chloride
NTO	natural transition orbitals	PWM	pulse width modulation
OA0	orbiting astronomical observatory	PWR	pressurised water reactor
OCR	optical character recognition		



QCD	quantum chromodynamics	TCR	temperature coefficient of resistance
QDMBPT	quasi-degenerate many-body perturbation theory	TDHF	time dependent Hartree-Fock
QED	quantum electrodynamics	TDM	time division multiplex(ing)
QPSK	quaternary phase shift keying	TDMA	time division multiple access
RAM	random access memory	TDPAAC	time differential perturbed angular correlation
RBE	relative biological effectiveness	TE	transverse electric
RC	resistance-capacitance	TEA	transversely excited atmospheric
RCNDO	Rydberg CNDO	TEM	transverse electromagnetic or transmission electron microscopy
R & D	research and development	TEXT	Texas Experimental Tokamak
RF	radio frequency	TFTR	Tokamak fusion test reactor
RFI	radio frequency interference	TGFB	triglycine fluoroberyllate
RHEED	reflection high energy electron diffraction	TGS	triglycine sulphate
RINDO	Rydberg INDO	TGSe	triglycine selenate
RKKY	Rudermann-Kittel Kasuya-Yosida	TJS	transverse junction stripe
RLC	resistance-inductance-capacitance	TLD	thermoluminescent dosimeter(-ry)
RMS	root-mean-square	TM	transverse magnetic
ROM	read-only memory	TMMC	tetramethylammonium manganese chloride
RPA	random phase approximation	TOP	transient overpower accident
RPM	relaxation potential model	TNS	The next step
SAMO	simulated ab initio molecular orbitals	TRAPATT	trapped plasma avalanche triggered transit
SAS	small astronomy satellite	TREAT	transient reactor test facility
SAW	surface acoustic waves	TRM	thermoremanent magnetisation
SCF	self consistent field	TSC	thermally stimulated currents
SCL	space charge limited	TSEE	thermally stimulated exo-electron emission
SCPT	self consistent perturbation theory	TTF	tetrathiofulvalinium
SCR	silicon controlled rectifier	TTL	transistor transistor logic
SDM	space division multiplexing	TTT	tetrathiotetracene
SDO	shielded diatomic orbitals	TUCA	transient undercooling accident
SEHF	spin extended Hartree-Fock	TV	television
SEM	scanning electron microscope	TW	travelling wave
SFE	solar-flare effect	TWT	travelling wave tube
SGHWR	steam generating heavy water reactor		
SHF	superhigh frequency	UCHF	uncoupled Hartree-Fock
SHG	second harmonic generation	UHF	ultra high frequency unrestricted Hartree-Fock
SIMS	secondary ion mass spectrometer		
SIN	Swiss Institute of Nuclear Research	UHV	ultra high voltage
SINDO	scaled INDO	UKAEA	United Kingdom Atomic Energy Authority
SISAM	spectrometer with interference selective amplitude modulation	ULF	ultra low frequency
		UMD	united microwave devices
SMC	Small Magellanic Cloud	UPS	ultraviolet photoelectron spectra
SMS	synchronous meteorological satellite	US	ultrasonic
S/N	signal-to-noise	UV	ultraviolet
SOG	strongly orthogonal geminal		
SOS	silicon on sapphire	VB	valence bond
SPA	separated pair approximation	VCR	video cassette recorder
SPC	stored program control	VDM	vector dominance model
SPEAR	Stanford positron electron asymmetric ring	VDU	visual display unit
SPHF	spin polarised Hartree-Fock	VHF	very high frequency
SPIN-CIPSI	spin symmetry adapted generalisation of CIPSI	VLBI	very long base line interferometry
SPS	super proton synchrotron (CERN)	VLF	very low frequency
SQUID	superconducting quantum interference device	VLSI	very large scale integration
SRMCASE	symmetry-restricted-multiconfiguration annihilation of single excitations	VOR	VHF omnidirectional range
SSB	single sideband	VPE	vapour phase epitaxy
SSC	sudden storm commencement	VRC	visual record computer
SSI	supersonic transport	VRDDO	variable retention of diatomic differential
STD	salinity-temperature-depth or subscriber trunk dialling	VSb	vestigial sideband
STEM	scanning transmission electron microscopy	VSEPR	valence shell electron pair repulsion
STO	Slater-type orbitals	VSWR	voltage standing wave ratio
STOL	short take-off and landing	VTOL	vertical take-off and landing
STP	Slater-transfer Preuss	VTR	voltage transformation ratio or video tape recorder
SUHFC	spin unrestricted Hartree-Fock with local approximation for correlations	VUV	vacuum ultraviolet
		VVER	water moderated water cooled reactors
SW	short wave		
SWR	standing wave ratio	WVER	water moderated water cooled reactors
SXAPS	soft X-ray appearance potential spectrum	XPS	X-ray photoelectron spectra
TBBA	terephthal-butylaniline	ZEBRA	zero energy breeder reactor assembly
TCNE	tetracyanoethylene	ZGS	zero gradient synchrotron
TCNQ	tetracyanoquinodimethane	ZPPR	zero power plutonium reactor



# Subject Index

## M-centres

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molecular rotorsional states see molecular libration

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**molecular vibration**

see also *Fermi resonance*; *macromolecular dynamics*; *molecular force constants*; *molecular rotational-vibrational energy transfer*; *molecular spectra*; *molecular vibration calculations*; *molecular vibration in solids*;

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**niobium alloys**

- see also *niobium compounds*  
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## nuclear reactions and scattering

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**organic compounds**

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## phase diagrams

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photocells *see* photoelectric cells

photochemical energy conversion *see* chemical energy conversion

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*see also avalanche photodiodes*

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*see also deuteron photodisintegration; photofission*

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Generalities and properties of unspecified materials only. For specific materials see semiconductor materials.

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**spin wave resonance** see ferromagnetic resonance

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## stellar internal processes

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stress birefringence *see mechanical birefringence*

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